



ANALYTICAL SUMMARY REPORT

February 19, 2019

Environmental Consulting Services, LLC
2924 Tartan Rd
Billings, MT 59101-9486

Work Order: B19012227

Project Name: Klamert Manure NMP

Energy Laboratories Inc Billings MT received the following 2 samples for Environmental Consulting Services, LLC on 1/30/2019 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B19012227-001	DC-M1	01/29/19 15:30	01/30/19	Manure	Metals by ICP/ICPMS, Total or Soluble CNMP Excel Report Format Moisture Ammonia as N, KCL Extract Nitrate as N, KCL Extract Total Kjeldahl Nitrogen Total Metals Digestion by SW3050B Solids Content
B19012227-002	PC-1M	01/29/19 16:20	01/30/19	Solid	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:



LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC
Project: Klamert Manure NMP
Lab ID: B19012227-001
Client Sample ID: DC-M1

Report Date: 02/19/19
Collection Date: 01/29/19 15:30
Date Received: 01/30/19
Matrix: Manure

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	31.3	wt%		0.2		D2974	02/08/19 13:25 / srm
Solids, Total	68.7	wt%		0.01		A2540 G	02/08/19 16:50 / srm
CHEMICAL CHARACTERISTICS							
Ammonia as N, KCL Extract	55	mg/kg	D	6		ASA33-7	02/13/19 11:33 / srm
Nitrate as N, KCL Extract	253	mg/kg	D	6		ASA33-8	02/13/19 13:11 / srm
Total Kjeldahl Nitrogen	7560	mg/kg		10		ASA31-3	02/14/19 08:43 / srm
METALS, TOTAL - EPA SW846							
Phosphorus	3770	mg/kg		10		SW6010B	02/12/19 17:16 / rlh
Potassium	13300	mg/kg		50		SW6010B	02/12/19 17:16 / rlh

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC
Project: Klamert Manure NMP
Lab ID: B19012227-002
Client Sample ID: PC-1M

Report Date: 02/19/19
Collection Date: 01/29/19 16:20
Date Received: 01/30/19
Matrix: Solid

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Moisture (As Received)	35.4	wt%		0.2		D2974	02/08/19 13:25 / srm
Solids, Total	64.6	wt%		0.01		A2540 G	02/08/19 16:50 / srm
CHEMICAL CHARACTERISTICS							
Ammonia as N, KCL Extract	103	mg/kg	D	6		ASA33-7	02/13/19 11:34 / srm
Nitrate as N, KCL Extract	1200	mg/kg	D	50		ASA33-8	02/13/19 13:26 / srm
Total Kjeldahl Nitrogen	8520	mg/kg		10		ASA31-3	02/14/19 08:43 / srm
METALS, TOTAL - EPA SW846							
Phosphorus	4480	mg/kg		10		SW6010B	02/12/19 17:21 / rlh
Potassium	15400	mg/kg		50		SW6010B	02/12/19 17:21 / rlh

Report Definitions:
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QCL - Quality control limit.
D - RL increased due to sample matrix.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client:	Environmental Consulting Services, LLC	Report Date:	02/19/19
Lab ID:	B19012227	Collection Date:	01/29/19
Client Sample ID:	DC-M1	Date Received:	01/30/19

Manure Testing - CNMP Manure Package

<u>Analyte</u>	<u>Dry Basis</u> <u>mg/kg</u>	<u>----- As Received Moisture Basis -----</u>		
		<u>Percent</u>	<u>mg/kg</u>	<u>pounds/ton</u>
Moisture	0.0	31.3		
Solids	100.0	68.7		
Total Kjeldahl Nitrogen	7,560	0.52	5,194	10.4
Nitrate as N	<u>253</u>	<u>0.02</u>	<u>174</u>	<u>0.3</u>
Nitrogen, Total as N	7,813	0.54	5,368	10.7
Phosphorus, Total as P	3,770	0.26	2,590	5.2
Phosphorus, as P₂O₅	8,633	0.59	5,931	11.9
Potassium, Total as K	13,300	0.91	9,137	18.3
Potassium, as K₂O	15,960	1.10	10,965	21.9

NOTES:

To adjust to a different moisture, divide the current value by the percent dry matter (expressed as a decimal), then multiply by the desired percent dry matter (also expressed in a decimal). For example, total nitrogen was 80 pounds per ton at 50% moisture and the usual spreading moisture is 45%, 80 divided by 0.50 = 160 pounds of total nitrogen per dry ton of manure. Then multiply 160 x 0.55 (% DM) = 88 total pounds of nitrogen per ton at 45% moisture.

For liquid or semi-liquid manure slurry you can calculate pounds per 1000 gallons by multiplying the pounds/ton concentration by 4.

mg/kg = ppm

LABORATORY ANALYTICAL REPORT

Client:	Environmental Consulting Services, LLC	Report Date:	02/19/19
Lab ID:	B19012227-002	Collection Date:	01/29/19
Client Sample ID:	PC-1M	Date Received:	01/30/19

Manure Testing - CNMP Manure Package

<u>Analyte</u>	<u>Dry Basis</u> <u>mg/kg</u>	<u>----- As Received Moisture Basis -----</u>		
		<u>Percent</u>	<u>mg/kg</u>	<u>pounds/ton</u>
Moisture	0.0	35.4		
Solids	100.0	64.6		
 Total Kjeldahl Nitrogen	8,520	0.55	5,504	11.0
Nitrate as N	<u>1,200</u>	<u>0.08</u>	<u>775</u>	<u>1.6</u>
Nitrogen, Total as N	9,720	0.63	6,279	12.6
 Phosphorus, Total as P	4,480	0.29	2,894	5.8
Phosphorus, as P₂O₅	10,259	0.66	6,627	13.3
 Potassium, Total as K	15,400	0.99	9,948	19.9
Potassium, as K₂O	18,480	1.19	11,938	23.9

NOTES:

To adjust to a different moisture, divide the current value by the percent dry matter (expressed as a decimal), then multiply by the desired percent dry matter (also expressed in a decimal). For example, total nitrogen was 80 pounds per ton at 50% moisture and the usual spreading moisture is 45%, 80 divided by 0.50 = 160 pounds of total nitrogen per dry ton of manure. Then multiply 160 x 0.55 (% DM) = 88 total pounds of nitrogen per ton at 45% moisture.

For liquid or semi-liquid manure slurry you can calculate pounds per 1000 gallons by multiplying the pounds/ton concentration by 4.

mg/kg = ppm



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC

Report Date: 02/19/19

Project: Klamert Manure NMP

Work Order: B19012227

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B								Analytical Run: ICP203-B_190212A		
Lab ID: QCS	2	Initial Calibration Verification Standard								02/12/19 10:05
Phosphorus		7.64	mg/L	0.10	96	90	110			
Potassium		39.4	mg/L	1.0	98	90	110			
Lab ID: ICSA	2	Interference Check Sample A								02/12/19 10:09
Phosphorus		-0.0432	mg/L	0.10						
Potassium		-0.00383	mg/L	1.0						
Lab ID: ICSAB	2	Interference Check Sample AB								02/12/19 10:13
Phosphorus		8.84	mg/L	0.10	88	80	120			
Potassium		18.9	mg/L	1.0	95	80	120			
Method: SW6010B								Batch: 130161		
Lab ID: MB-130161	2	Method Blank								02/12/19 16:47
Phosphorus		ND	mg/kg	2						
Potassium		ND	mg/kg	6						
Lab ID: SRM-130161	2	Standard Reference Material								02/12/19 17:03
Phosphorus		238	mg/kg	5.0	84	55	145			
Potassium		6020	mg/kg	6.3	95	86	114			
Lab ID: B19020297-001ADIL	2	Serial Dilution								02/12/19 17:29
Phosphorus		3490	mg/kg	19				2.1	10	
Potassium		531	mg/kg	31				1.2	10	
Lab ID: B19020297-001APDS	2	Post Digestion/Distillation Spike								02/12/19 17:33
Phosphorus		3890	mg/kg	5.0		75	125			A
Potassium		3090	mg/kg	6.4	100	75	125			
Lab ID: B19020297-001AMS3	2	Sample Matrix Spike								02/12/19 17:37
Phosphorus		3570	mg/kg	5.0		75	125			A
Potassium		2880	mg/kg	6.0	98	75	125			
Lab ID: B19020297-001AMSD	2	Sample Matrix Spike Duplicate								02/12/19 17:41
Phosphorus		3680	mg/kg	5.0		75	125	3.2	20	A
Potassium		2770	mg/kg	5.6	101	75	125	3.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC

Report Date: 02/14/19

Project: Klamert Manure NMP

Work Order: B19012227

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA31-3							Batch: R315388		
Lab ID: B19012213-001A DUP	Sample Duplicate					Run: MISC-SOIL_190213B		02/14/19 08:43	
Total Kjeldahl Nitrogen	14100	mg/kg-dry	68				2.7	30	
Lab ID: LCS-1902140843	Laboratory Control Sample					Run: MISC-SOIL_190213B		02/14/19 08:43	
Total Kjeldahl Nitrogen	672	mg/kg	10	102	50	150			
Lab ID: B19012213-001A MS	Sample Matrix Spike					Run: MISC-SOIL_190213B		02/13/19 13:50	
Total Kjeldahl Nitrogen	33800	mg/kg-dry	68	71	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC

Report Date: 02/14/19

Project: Klamert Manure NMP

Work Order: B19012227

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA33-7					Batch: OM_2-13-2019_11-23-31AM				
Lab ID: LCS	Laboratory Control Sample				Run: FIA205-B_190213A		02/13/19 11:24		
Ammonia as N, KCL Extract	14.1	mg/kg	1.0	70	70	130			
Lab ID: B19020297-001ADUP	Sample Duplicate				Run: FIA205-B_190213A		02/13/19 12:30		
Ammonia as N, KCL Extract	146	mg/kg	6.0				0.4	30	
Lab ID: B19020297-001AMS	Sample Matrix Spike				Run: FIA205-B_190213A		02/13/19 12:30		
Ammonia as N, KCL Extract	216	mg/kg	6.3	110	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Environmental Consulting Services, LLC

Report Date: 02/14/19

Project: Klamert Manure NMP

Work Order: B19012227

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA33-8					Batch: OM_2-13-2019_01-04-04PM				
Lab ID: LCS	Laboratory Control Sample				Run: FIA205-B_190213A		02/13/19 13:05		
Nitrate as N, KCL Extract	11.1	mg/kg	1.0	102	70	130			
Lab ID: B19011622-001ADUP	Sample Duplicate				Run: FIA205-B_190213A		02/13/19 13:23		
Nitrate as N, KCL Extract	2.80	mg/kg	1.0				0.0	30	
Lab ID: B19011622-001AMS	Sample Matrix Spike				Run: FIA205-B_190213A		02/13/19 13:24		
Nitrate as N, KCL Extract	7.88	mg/kg	1.0	97	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



Work Order Receipt Checklist

Environmental Consulting Services, LLC

B19012227

Login completed by: Briana G. Sangiuliano

Date Received: 1/30/2019

Reviewed by: BL2000\tedwards

Received by: bgs

Reviewed Date: 2/4/2019

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on all shipping container(s)/cooler(s)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on all sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input type="checkbox"/>
Container/Temp Blank temperature:	1.0°C No Ice		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None



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Page 1 of 1

Report Information (if different than Account Information)

Report Information (if different than Account Information)

Company/Name _____

Contact _____

Phone _____

Mailing Address *Same* _____

City, State, Zip *CA* _____

Email _____

Receive Report ☐ Hard Copy ☐ Email

Special Report/Formats:

☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other _____

Project Name, PWSID, Permit, etc.	Klamath Manure NMP		
Sampler Name	Jason Vollmer	Sampler Phone	406 254 1741
Sample Origin State	MT	EPA/State Compliance	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

MINING CLIENTS, please indicate sample type.
 if one has been processed or refined, call before sending.

☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*


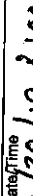
Matrix Codes

A - Air	W - Water
S - Soils/ Solids	V - Vegetation
B - Bioassay	O - Other
DW - Drinking Water	

[illegible]

All turnaround times are standard unless marked as RUSH.

Sample Identification (Name, Location, Interval, etc.)	Collection		Number of Containers	Matrix (See Codes Above)	See	RUSH TAT	ELI LAB 10 Laboratory Use Only
	Date	Time					
1 DC-11Z	1/29/19	3:30PM	1	S	X		B19012227
2 PC-11A	1/29/19	4:20PM	1	S	X		
3							
4							
5							
6							
7							
8							
9							
10							

Custody Record MUST be signed	Relinquished by (print) Tyson Volmer	Date/Time 1/30/19 3:00pm	Signature 	Received by (print)	Date/Time	Signature				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print) B. Davis, SA, W. J. and	Date/Time 1/30/19 0800	Signature 				
Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	LABORATORY USE ONLY	Payment Type CC Cash Check	Amount \$	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.



Trust our People. Trust our Data.
www.energylab.com

Billings, MT 800.735.4489 • Casper, WY 888.235.0515 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

BOTTLE ORDER 130066



SHIPPED TO: Environmental Consulting Services, LLC

Contact: Jason Vollmer

Order Created by: Wynn Pippin
Shipped From: Billings, MT
Ship Date: 1/29/2019
VIA: PickUp

Phone: (406) 794-1973

Project:

Bottle Size/Type	Bottles Per Samp	Method	Tests	Critical Hold Time	Preservative	Notes	Num of Samp
Manure (2 Sets)							
1 Liter Clear Glass Wide Mouth	1	FIELD	Supplies				1

<input checked="" type="checkbox"/> HNO3 - Nitric Acid	<input type="checkbox"/> H2SO4 - Sulfuric Acid	<input checked="" type="checkbox"/> NaOH - Sodium Hydroxide	We strongly suggest that the samples are shipped the same day as they are collected.	
<input checked="" type="checkbox"/> ZnAc - Zinc Acetate	<input checked="" type="checkbox"/> HCl - Hydrochloric Acid	<input type="checkbox"/> H3PO4 - Phosphoric Acid		
Material Safety Data Sheets(MSDS) Available @ EnergyLab.com ->Services -> MSDS Sheets				
Corrosive Chemicals: Nitric, Sulfuric, Phosphoric, Hydrochloric Acids and Sodium Hydroxide. Zinc Acetate is a skin irritant.				
Subcontracting of sample analyses to an outside laboratory may be required. If so, Energy Laboratories will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.				

Wynn Pippin

From: Jason Vollmer <jvollmer@enviroconsult.com>
Sent: Tuesday, January 29, 2019 1:01 PM
To: 'Wynn Pippin'
Subject: RE: Manure Sampling - MDEQ CAFO - Nutrient Management Plan

Ok, thank you.

Jason Vollmer

CEO / Consultant
Environmental Consulting Services, LLC
2924 Tartan Rd. Billings, MT 59101
Office: (406) 254-1741 Cell: (406) 794-1973
www.enviroconsult.com



ECS

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From: Wynn Pippin [<mailto:wpippin@energylab.com>]
Sent: Tuesday, January 29, 2019 12:22 PM
To: 'Jason Vollmer' <jvollmer@enviroconsult.com>
Subject: RE: Manure Sampling - MDEQ CAFO - Nutrient Management Plan

Yes. It is just a 1 quart bottle for each sample. I will put the order in right now.

From: Jason Vollmer [<mailto:jvollmer@enviroconsult.com>]
Sent: Tuesday, January 29, 2019 12:00 PM
To: 'Wynn Pippin'
Subject: Manure Sampling - MDEQ CAFO - Nutrient Management Plan

Hello Winn,

Can you please put together two sample container orders for the following:

1/25/2019 17.30.1334 : TECHNICAL STANDARDS FOR CONCENTRATED ANIMAL FEEDING OPERATION - Administrative Rules of the State of ...
<http://www.mtrules.org/gateway/RuleNo.asp?RN=17%2E30%2E1334> 4/6

(4) Manure that is land applied must be sampled at least once per year and analyzed for total nitrogen (as N), ammonium nitrogen (as NH₄-N), total phosphorus (as P₂O₅), total potassium (as K₂O), and percent dry matter solids). Except for percent dry matter, the results of this analysis must be expressed as pounds per 1,000 gals for liquid wastes and pounds per ton for solid manure. The sample must be representative of the manure that is to be applied to a field and must be collected and analyzed in accordance with (a) and (b).
(a) Solid manure must be sampled from at least ten different locations (subsamples) within the material to be applied from a depth of at least 18 inches below the surface. Subsamples must be thoroughly mixed in a clean receptacle and a sample of the mixed material must be collected and placed in a sealable plastic bag or other sample container approved by the analytical laboratory. The sample must be identified with the name, source, and date. The sample must be cooled to four degrees centigrade and analyzed within seven days or frozen at minus 18 degrees centigrade for up to six months or as directed by the analytical laboratory

specified in (6).

(b) Liquid manure must be agitated for a minimum of four hours prior to sample collection or until thoroughly mixed. A minimum of five one-quart subsamples must be collected from different locations in the storage facility. The subsamples must be collected from the liquid manure at a depth of least 12 inches below the surface. The subsamples must be combined into a single container and thoroughly mixed. A sample for laboratory analysis must be collected from the composited subsamples and placed into a clean one-quart plastic bottle or other sample container approved by the analytical laboratory. The sample must be identified with the name, source, and date. The sample container must not be completely filled. The sample must be cooled to four degrees centigrade and analyzed within seven days, or frozen at minus 18 degrees centigrade for up to six months or as directed by the analytical laboratory specified in

Let me know if I have given you sufficient information here?

Thank you-

Jason Vollmer

CEO / Consultant

Environmental Consulting Services, LLC

2924 Tartan Rd. Billings, MT 59101

Office: (406) 254-1741 Cell: (406) 794 -1973

www.enviroconsult.com



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